World Academy of Science, Engineering and Technology
International Journal of Economics and Management Engineering
Vol:10, No:5, 2016

Influence of a Company's Dynamic Capabilities on Its Innovation Capabilities

Lovorka Galetic, Zeljko Vukelic

***Abstract*—**The advanced concepts of strategic and innovation management in the sphere of company dynamic and innovation capabilities, and achieving their mutual alignment and a synergy effect, are important elements in business today. This paper analyses the theory and empirically investigates the influence of a company's dynamic capabilities on its innovation capabilities. A new multi-dimensional model of dynamic capabilities is presented, consisting of five factors appropriate to real time requirements, while innovation capabilities are considered pursuant to the official OECD and Eurostat standards. After examination of dynamic and innovation capabilities indicated their theoretical links, the empirical study testing the model and examining the influence of a company's dynamic capabilities on its innovation capabilities showed significant results. In the study, a research model was posed to relate company dynamic and innovation capabilities. One side of the model features the variables that are the determinants of dynamic capabilities defined through their factors, while the other side features the determinants of innovation capabilities pursuant to the official standards. With regard to the research model, five hypotheses were set. The study was performed in late 2014 on a representative sample of large and very large Croatian enterprises with a minimum of 250 employees. The research instrument was a questionnaire administered to company top management. For both variables, the position of the company was tested in comparison to industry competitors, on a five-point scale. In order to test the hypotheses, correlation tests were performed to determine whether there is a correlation between each individual factor of company dynamic capabilities with the existence of its innovation capabilities, in line with the research model. The results indicate a strong correlation between a company's possession of dynamic capabilities in terms of their factors, due to the new multi-dimensional model presented in this paper, with its possession of innovation capabilities. Based on the results, all five hypotheses were accepted. Ultimately, it was concluded that there is a strong association between the dynamic and innovation capabilities of a company.

***Keywords*—**Dynamic capabilities, innovation capabilities, competitive advantage, business results.

I. Introduction

TODAY'S business environment is marked by multiple advances in the fields of technology, global connectivity and the speed and intensity of change. This largely differs from the previous domain of organizational functioning of companies. The start of a new millennium created a new age in which even change has changed, and does not unfold linearly [1], while the creation of new values requires more than simply responding to market demands [2]. Abandoning the old operating patterns with openness and willingness for change, and the capability of executing dynamic actions and reactions, has become the fundamental determinant for the functioning of modern organizations.

Considering that a quantitative view of economics and business based on tangible variables has long been a thing of the past, the development of theories in the field of strategic management has resulted in a new view of business organization. This is reflected in the approach that a company should be viewed as a portfolio of its capabilities that represent the configuration of its organizational elements [3], and which are aligned with the dynamics of the current time. The final task of implementation of these capabilities is to create a unique concept of organizational functioning that, as a direct consequence, differentiates the company from other entities, thereby giving a competitive advantage. In light of this, it has become evident that the use of advanced concepts of strategic and innovation management in the sphere of company capabilities, and achieving their mutual alignment, is a necessity for corporate success.

On a market faced with a variety of competitive pressures, the resulting opportunities and threats have pushed innovation to the top of the priority list for company top management [4]. The need for proactive company management is based on agility and taking quick and meaningful business actions, and it has emphasized dynamic capability as an exceptionally important concept in operations. In line with the great importance of a company's dynamic and innovation capabilities, this paper considers both domains. Considering that the organizational capabilities of a company must be aligned in order to generate the desired synergy effect that will positively impact operations, their mutual effects are examined here.

Over time, there has been an evident evolution of those capabilities that are most important to a company. On the other hand, the progress in those areas necessary to build them has not been recorded [5]. In order to create an appropriate methodology for their creation, it is necessary to construct a model for their proper identification and use in an organization, with the aim of achieving a competitive edge and the desired business results. This paper presents a concrete model of company dynamic and innovation capabilities, which enables their identification and use for business purposes. The consideration of dynamic capabilities using this new model is based on the most significant scientific literature on this topic, adapted to meet the needs of modern business organizations in the 21st century.

Lovorka Galetic, PhD, is a professor at the Faculty of Economics & Business, University of Zagreb, Trg J. F. Kennedyja 6, 10000 Zagreb, Croatia (phone: 00385-1-238-3263; fax: 00385-1-233-5633; e-mail: lgaletic@efzg.hr).

ZeljkoVukelic, PhD, is with Marius Consulting, Vocarska 44, 10000 Zagreb, Croatia (phone: 00385-1-463-5454; fax: 00385-1-463-5757; e-mail: zeljko.vukelic@zg.t-com.hr).

The model for innovation capabilities is based on the official standards of the OECD and Eurostat. Empirical testing was performed on a population of large and very large Croatian businesses to test both of the said models, and to investigate their joint impacts on dynamic and innovation capabilities.

II. Company Dynamic Capabilities

With increasing and stronger competition and with the creation of new markets, companies now more than ever need to find creative solutions and new means of business thinking [6]. Since companies need continuous care, and not interventionist cures [7], they need to possess capabilities to successfully overcome the dynamics of their business environment, so that they can achieve strategic harmony with it. They need to be capable of independently influencing the dynamic changes of its business environment, in such a way that the company itself is the one shaping that change, for the purpose of achieving success. These capabilities determine the concept of a company's dynamic capabilities. They represent the system of capabilities whose key element is the ability to undertake complex adaptive processes within the company [8]. They are defined as the company's capability to reconfigure, redirect, transform and suitably shape and integrate its existing key competencies with external resources and with its strategic and complementary assets, so as to respond to the challenges put forth by the competition and imitations, and by rapid change and time limitations [9]. They relate to the company's ability to create an innovative response to a changing business environment [10], and represent the organization and strategic routines whereby the company achieves a new configuration of its resources through the life cycle of its respective market [11]. In general, the dynamic capabilities relate to those multi-dimensional processes that include sensing and seizing opportunities, managing resources, organizational activities, intensive knowledge use and management, and ultimately coordinates the company's business activities, with an emphasis on the current operating conditions that are subject to constant change. Ultimately, the point of possessing dynamic capabilities is to positively impact overall business results. In order to respond to the opportunities that arise in light of technological advances and shifts in customer expectations, a company needs more unique dynamic capabilities that are not easily imitated [12]. The uniqueness of these capabilities is the key factor which will create company differentiation. When an organization employs those business solutions that are unique to it, it will be in a position to become the market leader. Dynamic capabilities contribute to a company's ability to improve its performance, enables innovation of its products, the use of appropriate technologies, and its adaptation and preparations to survive in a constantly changing business environment [13]. As such, possessing these capabilities is of exceptional significant in today's business world.For all these reasons, the fundamental objective is to enable companies to determine whether they possess dynamic capabilities and their extent, and to give guidelines on how to use those capabilities in their daily business. In many organizations, it can be observed that certain business opportunities recognized as priorities were never implemented, others failed to have a strong bottom-line effect, while others yet were unsustainable, all due to inadequate success of the implementation process [14]. Oftentimes, the management concept of dynamic capabilities is not sufficiently clear, or it does not include concrete guidelines that deal with the active implementation of the process results of sensing, seizing, reconfiguring, transforming and integrating that are deemed to be the primary concepts of dynamic capabilities. In other words, the process of seizing includes the segment of making executive decisions and ultimate activity [15], and this is often not executed adequately. For that reason, the model of dynamic capabilities presented here separates these two segments, such that managerial decisions to seize business opportunities are positioned directly after they are sensed, while the ultimate activity of a company that leads to the business results is positioned at the end of the process. To this effect, a group of factors has been constructed in line with the present day needs, aimed at identifying the dynamic capabilities in an organization and their extent. For management, the order of these factors outlines the necessary organizational processes aimed at ensuring full exploitation of these capabilities for business purposes. The factors that make up the dynamic capabilities of a company are defined here, and they represent a new contribution to the knowledge of dynamic capabilities of companies, corresponding to the needs of modern business:

- sensing and seizing business opportunities,
- reconfiguring existing and acquire new resources,
- internal and external transformation of a company,
- integration of internal and external knowledge,
- corporate coordination and company activities.

The capability of sensing is the fundamental, initial element for determining dynamic capabilities. This capability is a systematic, dynamic, and constant process of implementation into the roots of the organization for revealing more or less visible opportunities in the business environment. A fresh perspective is often more valuable than pure strength of mind [1], which is often rooted in traditional strategic management and business models. Due to its static nature, it loses significance in the real time of today and in the future. Since the fundamental challenge for the capability to sense opportunities is bounded rationality [16], a company needs to develop a system that will objectively open up ways to detect and collect the necessary information and knowledge, so as to properly identify opportunities. Once a company has identified its opportunities, organizational processes are set in motion. In this paper, the term seizing opportunities involves making strong executive decisions to undertake new business processes, in order to actualize the sensed opportunities and to direct all the available resources towards executing this process. To that extent, seizing here is not perceived as the ultimate achievement of the result, but as the first step of the process leading to it.

The company must recognize the dynamic nature of its environment and of its resources [17]. A characteristic of

intelligent business activity is the distribution of the appropriate resources or assets and their placement in the necessary activity, and having the ability and motivation to apply them appropriately [18]. Dynamic capabilities are more than just a simple add-on to the concept of resource theory, since they manipulate resources and other capabilities that create value [19]. The point of activity of dynamic capabilities on company resources is to enable the organization to have and manage a unique set of resources, which will sufficiently differentiate it from others. For this to be possible, the company needs to be capable of actively reconfiguring its existing resources, and if necessary, acquiring new ones. This brings the organization nearer to a position from which it may successful adapt to changing market conditions, and to independently set new business conditions for others.

New events in the business environment demand changes within the organization, as a certain group of business routines may lose their value if they support company competencies that are no longer valued on the market or if they are easily imitated by the competition [9]. In order for an organization to successfully adapt to future needs, it is necessary to perceive the strategy that the company must first unlearn part of its past before it can begin its transformation for the future [20]. Following this, a company must constantly be able to transform and retransform [16]. Company transformation includes changes at various organizational levels depending on need, and represents the consequence of configuration, while strategy making is the process that leads the company from one state to another [21].

Retransformation is the ability of the organization to prepare for new changes following the implementation of one transformation should the market situation so demand, with the aim of retaining its competitive edge or gaining a new edge in its current or a new economic branch. The possibility of successful internal transformation when business demands are caused by change is an important requirement for an organization striving to overcome the current market challenges, and it relates to the view of the organization from within. If the outward view of the company is considered, the needs set before a modern organization is the ability for its successful transformation towards clients, suppliers, external institutions and other relevant factors.

In today's turbulent times, greater attention should be focused on the company's ability to learn [22],the dynamic characteristics of new markets calls for the establishment of a dynamic model of how to strategically handle knowledge in the company. Within the organization, there are links between the integration of knowledge and its capabilities. This integration relates to the possibilities of combining individual knowledge into new operative capabilities of the organization [23]. The greater the extent of knowledge integrated into the company's capabilities, the more difficult they are for the competition to imitate [24]. Knowledge is not static, and innovative knowledge today will be fundamental knowledge tomorrow. Therefore, defending and improving the competitive position of a company requires continuous learning and the acquisition of knowledge. A combination of external knowledge with unique internal knowledge may result in completely new and unique organizational knowledge [25], which is required in today's business conditions. Companies need to be in a position where they can review and employ the knowledge useful to it, both internal and external in nature as, ultimately, the fact that integrated know-how from both within and outside an organization is an important factor for its success [15].

In order to be in a position to engage its dynamic capabilities, a company has to be able to coordinate its resources and the previously described tasks and processes, in order to create new operative capabilities. The process of cooperation and coordination of resources at a company's disposal is a precondition for actualizing its productive activities [26]. Coordinating the completed processes and the implementation of all preceding steps and final activities, in the sense of using the dynamic capabilities, leads to the achievement of business results. Company management is the top level for managing corporate coordination. The importance of implementation was seen in a 2014 global study that showed that companies implementing strategic activities scored, on average, 30 percent better in financial and success indicators than those that did not [14]. The ultimate achievement of the business goal is based on the activities undertaken, and is a direct consequence of the company's agility. This implies its ability to develop and employ its capabilities in order to successfully compete on an uncertain and unpredictable market [27]. Agility is the collection of possible business initiatives the company can readily implement by leveraging predefined competencies that manage cost and risk [28]. It represents the successful exploitation of competitive factors, such as resource integration, that can reconfigure those best practices in a knowledge-rich environment to provide customer-driven products and services on a rapidly evolving market [29]. From the above definition, it becomes evident that agility is ultimately oriented towards the achievement of corporate goals, i.e. achieving the desired business result and competitive edge, via factors concerning resources, transformation processes, knowledge, and other organizational competencies.

Ultimately, the five previously defined factors together form a new multi-dimensional model of dynamic capabilities that meet the current requirements. This model clearly describes the course of the necessary activities. In sensing business opportunities, their exploitation is considered and internal decisions are made to undertake new business processes in order to seize those opportunities, including the engagement of all the available resources and means to execute these processes. After management decides to seize an identified opportunity, the company must optimally reconfigure or acquire the necessary resources, implement its internal and external transformation, and integrate internal and external know-how. The final step is the coordination of the preceding processes and undertaking the business activities.

III. Company Innovation Capabilities

Innovation in business has long been a top priority of company management. Innovation is defined as the successful exploitation of ideas [30]. It is the creation of something new through learning processes and creating know-how, including competencies and capabilities that change, so as to create a quality outcome in a new way [31] and it represents the successful production, assimilation, and exploitation of novelties in the socioeconomic domain [32]. Innovation can be defined as a special function of entrepreneurship in creating new resources that general wealth, or endows existing resources to improve their potential for generating wealth [33]. It can also be defined as the creation, invention and/or implementation of new or improved products, services, processes, systems, organizational structures or business models, aimed at creating new value for customers, and financial returns for the company [34], or as the application of new ideas to products, processes or any other aspect of corporate activity [35]. Furthermore, the definition of innovation also relates to the successful exploitation of ideas that are new to a business, economic branch, or sector, regarding products, services, business processes, and models, marketing and supporting technologies [30]. A definition of innovation that unites many of its determinants and elements is the definition officially accepted by the Organisation for Economic Co-Operation and Development (OECD) and EUROSTAT (Statistical Office of the European Communities): An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations [42].

In considering innovation, it becomes clear that it relates to the inclusion of new and the exclusion of old elements. The literature states that the function of innovation is to introduce novelty into the economic sphere [31], and that innovation, above all, means the sloughing off of yesterday [36], which is dependent on "organized abandonment" [37]. In other words, innovation is all that changes the potential to created value from existing resources [38]. Unlike in the very recent past, new age management often seeks radical actions, in the sense of rapid adoption of change and completely new business directions. With this, the rapid abandonment of outdated business concepts and the introduction of completely new ones is becoming increasingly important. In order for an organization to be able to successfully adopt and implement such innovative processes, in view of the demanding market competition today, it needs to have highly developed innovation capabilities. With that, the concept of company innovation capabilities is facing new challenges.

Company innovation capability is defined as the ability to continuously transform knowledge and ideas into new products, processes, and systems, for the benefit of the firm [39]. It allows companies to execute a series of innovations that create business value [40]. Possessing these capabilities means that the firm's business strategy is centered around finding innovative solutions that customers or clients need, and that it has the necessary resources and processes to allow for a certain degree of experimentation, while calculating for possible risk. Innovation must be measured and must be an integral part of the system of key performance indicators, and the firm must apply human resource policies that support and stimulate innovativeness [40].

Considering that innovation is an intuitive and creative process and is difficult to measure [41], determining the degree of possession of a company's innovation capability is a demanding process that requires a systematic approach. This is seen in the frameworks and standards that define the measure of its intensity. The main international standards for this have been prepared by the OECD and Eurostat. From the synthesized results of research questionnaires on this topic and the scientific papers that largely influenced their development [31], manuals were developed as a solid foundation for research on the possession of innovation capabilities, in the form of the Oslo, Canberra and Frascatti manuals. They test the possession of innovation capabilities with regard to the product or service, business process, company organization, marketing activities, company cooperation with other organizations, access to knowledge and information, and the ability to acquire technology and knowledge [42]. Integrating the function of research and development and working on significant technological innovations are the areas of innovation research with the longest history [31]. Therefore, these properties have been examined with regard to research and development (R&D), the engagement of professional staff entrusted with the creation of new processes and technical staff in the function of operational support, and R&D expenditures [43], [44].

The greater the innovation capabilities of a company, the better its innovative performance will be [39] which in turn positively impacts company performance. It can be concluded that the organization's performance becomes increasingly dependent on its innovation capabilities [45]. With this in mind, it is possible to further the basic definition of innovation. Innovation today is a competitive advantage, supported in the strong fundamental capabilities of a company with regard to quality, efficacy, speed, and flexibility [39]. These determinants are the fundamental element that should guide management in their operations and efforts to achieve the best possible corporate result, presently and in the future. The dynamic element seen in this determinant suggests the need to consider innovation, and the innovation capabilities of a company, in terms of the dynamic concept of operations described within the section on dynamic capabilities.

IV. Theoretical Connections between Dynamic and Innovation Capabilities

With a view to the reality of global business today, this paper ultimately suggests the exceptionally dynamic character of the current market conditions. The dynamic environment of a company requires that it establish a dynamic internal system. It is important to realize that interactions between company segments are dynamically connected, thus creating a whole that is constantly evolving and impacting its environment [46].

On the one hand, it is certain that the company operation dynamics are best described within the concept of dynamic capabilities, while on the other, the literature dealing with innovation confirms its dynamic character stems from its very nature. As such, it is possible to draw theoretical connections between dynamic and innovation capabilities, and to examine those connections in both directions.

It is certain that the capabilities a company has today will likely not be sufficient in the future. Frequent strategic turnabouts that can monitor innovative processes in a company will influence the need for constant updating of innovation capabilities that, as a concept, are in continuous transition. In that way, the active and dynamic components making up the concept of innovation refer to the determinant of innovation capability of a company, which requires constant perfection. These are the innovative dynamic processes within a company.

The balance of innovation is a concept used to view innovation performance. Within three fundamental groups — the enablers of innovation, company activities, and outputs — this clearly indicates the need for a dynamic approach to implementing innovation [47]:

- enablers capture the main drivers of innovation that are external to the firm captured in the human resources dimensions and the availability of finance for innovation projects;
- company activities relate to their innovation efforts through the appropriate investment policy and dynamic entrepreneurial efforts and collaboration efforts;
- outputs capture the outputs of the company's innovation activities, in the sense of innovative solutions on the market or within the organizations, covering technological and non-technological innovations, and economic success derived from innovation activities.

The dynamic aspects of observing innovation is evident in the enabler and output elements, and directly involves the company activities through the entrepreneurially conceived dynamic approach. Furthermore, it is evident that the remaining concepts have a more or less direct view to the dynamic character of innovation, and the innovation capability of a company.

Knowledge is certainly the highest priority innovation asset. From the management perspective, knowledge in the context of innovation should be viewed in multiple dimensions, all of which are closely and dynamically related. An organization must be capable of learning, though the process must not be limited to the passive collection of information and learning, as this will not be sufficient to stimulate and achieve innovation. Innovative companies are, above all, founded on a dynamic system of organizational learning [48]. This dynamic system should be employed in the management of both explicit and visible knowledge, and implicit and invisible knowledge. Learning and creating knowledge, as a component of dynamic capability, certainly has a strong influence on the company's possession of innovation capabilities. Also, through the creative dimension of newly created knowledge seen in innovative ideas, and present in creative processes of transforming sensed opportunities into specific products and services as dynamic capabilities, both the dynamic character of innovation and the innovative character that is very desirable in dynamic capability are evident.

Dynamic capabilities relate to a company's ability to generate an innovative response to a changing business environment [10]. In line with this, these capabilities involve the organization's adaptation to change, including innovative elements of responses to new circumstances, and taking advantage of new developments as business opportunities. Further review of the scientific literature in the area of dynamic capabilities expands the domain of their theoretical links with innovation, and thus with the innovation capabilities of the company. The perspective of dynamic capabilities relates to the operating conditions in a competitive environment marked by innovation, rivalry in price and performance, the imperative to increase returns, and the 'creative destruction' of existing capabilities. The accompanying approach is designed for the purpose of building a better theory of firm performance in certain economic branches and in informing management [9]. The scientific literature has identified the following three elements of dynamic capability [49]:

- adaptive capability is the firm's ability to identify and capitalize on emerging market opportunities;
- absorptive capability is the firm's ability to recognize the value of new, external information, assimilate it, and apply it to commercial ends, and
- innovative capability.

Adaptive and absorptive capabilities do not necessarily have a direct effect on differentiation by making a company unique on the market, and their presence independently significantly reduces the positive effect on the organization. This positive effect can only be achieved in the fullest sense through the third element listed, in which a direct theoretical link can be observed between dynamic capability and innovation.

In observing the results of the activity of dynamic capability, it increases the level of understanding for changing customer demands, and can assist the company to take innovative measures [13]. Also, dynamic capabilities can be seen as a tool through which the operational capability can be reconfigured and manipulated by management in order to create new and innovative forms of competitive advantage [50]. Ultimately, dynamic capabilities facilitate a company by improving its performance, enabling innovativeness of products, the use of appropriate technologies, and the company's adaptation and preparation for survival under conditions of a constantly changing business environment [13]. It is evident that the theoretical links between dynamic and innovation capabilities can be observed from several perspectives, and ultimately through the results of business activities. The listed theoretical links between these two concepts thus suggest the need for empirical research on this topic.

V. Empirical Study – Analysis of the Influence of a Company's Dynamic Capabilities on its Innovation Capabilities

In the empirical study, a research model was posed to relate company dynamic and innovation capabilities. One side of the model features the separate variables that are the determinants of dynamic capabilities defined through their factors, while the other side features the determinants of innovation capabilities pursuant to the OECD and Eurostat standards. The model of association between dynamic and innovation capabilities is shown in Fig. 1.

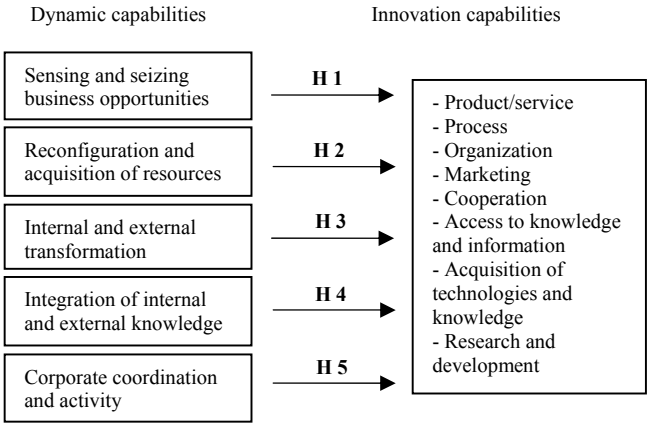

Fig. 1 Research model to investigate the influences of a company's dynamic capabilities on its innovation capabilities

With regard to this research model, the following hypotheses were set:

H1. The existence of a company's dynamic capability to sense and seize business opportunities is associated with its innovation capabilities

H2. The existence of a company's dynamic capability to reconfigure and acquire resources is associated with its innovation capabilities

H3. The existence of a company's dynamic capability for internal and external transformation is associated with its innovation capabilities

H4. The existence of a company's dynamic capabilities for the integration of internal and external know-how is associated with its innovation capabilities

H5. The existence of a company's dynamic capability for corporate coordination and activities is associated with its innovation capabilities

A. Methodological Framework of the Study

The study was conducted in late 2014 on a population of large and very large Croatian enterprises, i.e. meeting the criteria of a minimum of 250 employees. The total population consisted of 624 companies, and 114 filled out and returned the questionnaire, for a return rate of 18.27%. With that, the sample is representative, particularly noting that the companies in the sample employ 10.9% of all employees in the Republic of Croatia [54]. The research instrument was a questionnaire. In filling out the questionnaire, those surveyed outlined their perceptions of the measurable properties of the company. The possession of dynamic capabilities was tested through 10 questions grouped by their identification factor, and innovation capabilities through 10 questions in accordance with the OECD and Eurostat guidelines. Company top management was surveyed. For the purposes of measuring the properties of dynamic and innovation capabilities of companies, the Likert five-point scale was used. For both variables, the position of the company was tested in comparison to industry competitors, on a five-point scale. A score of one meant: significantly below the competition; score of two: below the level of the competition; score of three: at the level of the average competition; score of four: above the level of the competition, and score of five: significantly above the competition.

With regard to the size of companies from the sample, statistical analysis showed that 64% were large companies (pursuant to the criteria of 250 to 1000 employees) and 36% were very large companies (pursuant to the criteria of over 1000 employees). In terms of ownership structure, 92.1% of the companies in the sample are privately owned, while 7.9% are under majority state ownership.

B. Results of the Empirical Study

Table I gives an overview of the descriptive analysis of the indicators of possessing dynamic capabilities within the surveyed companies (n=114).

The descriptive statistics show good to very good indicators of the arithmetic mean of the determinants of dynamic capabilities, representing an overall good result of the surveyed companies. Following the above, it is concluded that the companies from the sample possess a good level of dynamic capabilities. Previous studies have reported that the metric of dynamic capabilities that has been insufficiently examined by the companies is the company's capability to offer the market a new product or service (time to market). A global study from 2010 on a sample of 1590 members of company top management, including the main world markets and economic branches, showed that only 20% of companies supervise and measure this capability [51]. The present study contained this metric, which marks the ultimate business activities and which outlines the significance of a new, fifth factor in the dynamic capabilities model presented in this paper, i.e. corporate coordination and activities. The above average values of this response in comparison to others indicate that the surveyed companies have a pronounced and strong level of this capability. This result is exceptionally strong in the turbulent business conditions of today, when rapid, new activities are necessary.

Table II presents the results of the descriptive analysis of the possession of innovation capabilities of the surveyed companies (n=114).

TABLE I
DESCRIPTIVE ANALYSIS OF INDICATORS OF THE POSSESSION OF DYNAMIC CAPABILITIES FOR THE COMPANIES IN THE RESEARCH SAMPLE

ELEMENTS	Arithmetic mean	St. dev.
Company possesses the internal capabilities to sense, interpret and react to business opportunities in its environment	3.82	0.68
Company possesses internal structures, procedures and mechanisms to seize opportunities from its environment, with the aim of improving business results	3.76	0.79
- **Sensing and seizing opportunities**	**3.79**	**0.68**
Company is capable of successfully reconfiguring existing resources in the event of changing operating conditions	3.56	0.80
Company is capable of successfully and rapidly acquiring new external resources necessary in the event of changing operating conditions	3.75	0.92
- **Reconfiguration and acquisition of resources**	**3.66**	**0.78**
Company is capable of successfully conducting internal transformation in response to changing operating conditions	3.48	0.77
Company is capable of successfully transforming towards its clients, suppliers and external institutions in the event of a business need caused by changing operating conditions	3.80	0.69
- **Internal and external transformation**	**3.64**	**0.68**
Company is capable of integrating new knowledge from outside the company borders into its new operating capabilities	3.82	0.90
Company is capable of improving its existing operating capabilities by using new knowledge as a consequence of learning in the organization	3.70	0.75
- **Integration of internal and external knowledge**	**3.76**	**0.76**
Company is capable of coordinating and reorganizing corporate resources, tasks and activities, with the aim of creating new operating capabilities of the company	3.67	0.71
Company is capable of offering new products or services to the market in a short time (time to market)	3.82	0.95
- **Corporate coordination and activities**	**3.75**	**0.75**
COMPANY POSSESSES DYNAMIC CAPABILITIES	**3.72**	**0.67**

TABLE II
DESCRIPTIVE ANALYSIS OF INDICATORS OF THE POSSESSION OF INNOVATION CAPABILITIES AMONG THE COMPANIES IN THE SAMPLE

ELEMENTS	Arithmetic mean	St. dev.
Introducing a new or significantly improved product or service with regard to its characteristics or intended purpose, which includes significant improvements in the technical specifications, including software, ease of use or other functional characteristics	3.80	0.91
Implementation of new or significantly improved methods to produce or deliver goods or services, which includes significant changes in the accompanying techniques, equipment and/or software	3.67	0.79
Implementation of new organizational methods in the company's corporate practice, organization of work posts or relations with external entities	3.60	0.70
Implementation of new marketing methods, which includes significant changes in product design, packaging, its placement, promotion or pricing	3.81	0.96
Active company participation in joint innovative projects with other organizations	3.14	0.85
Access to open sources of knowledge without the obligation of payment, including access to information via membership in various associations, at conferences, via journal subscriptions for marginal fees	3.84	0.72
Acquisition of technology and knowledge via their purchase from external entities, without active participation in creation of the same	3.77	0.79
Share of professional staff engaged in creating new knowledge, products, processes, methods and business systems, including management of the above, in the total number of company employees	3.87	0.71
The share of technical staff functioning as expert support for the implementation of applications, concepts and operational methods in the area of research and development in the company, in the total number of company employees	3.85	0.73
Share of expenditures for research and development in the total company budget	3.20	0.80
COMPANY POSSESSION OF INNOVATION CAPABILITIES	**3.65**	**0.60**

As in the previous case, the descriptive statistic results indicate that the observed companies have a good level of innovation capabilities. A 2009 study on 170 companies covering the markets of North and South America, Europe and the Asia-Pacific region showed that 52% of companies used five or fewer metrics to determine their level of possession of innovation capabilities [52]. This is not sufficient considering that innovation is a multi-dimensional construct. Experience in the measurement of the level of possession of innovation capabilities of a company indicate the need to use ten to twelve metrics so as to enable the creation of information necessary to manage company innovation policy, instead of merely reacting to the innovation process [51]. The best metrics for determining the level of possession of innovation capabilities are those that include both the input and output levels of innovation [53]. The present study used ten metrics, including the input and output of innovation, thereby creating a satisfactory framework to express the results.

The next results are those confirming the set hypotheses. In order to test the hypotheses, correlation tests were performed to determine whether there is a correlation between each individual factor of company dynamic capabilities with the existence of its innovation capabilities, in line with the research model.

To test the first set hypothesis, a correlation test was performed to examine whether there is a correlation between a company's dynamic capability to sense and seize business opportunities with the existence of its innovation capabilities. The results of the correlation test for the surveyed companies showed that there is a high level of association between possessing the dynamic capability to sense and seize opportunities with the existence of innovation capabilities (Spearman coefficient 0.794, two-tailed significance 0.000). This result empirically confirms the theoretical conclusion that

there is an association between the elements of dynamic and innovation capabilities, and based on this analysis, the H1 hypothesis is accepted. It is concluded that there is an association between a company's capability to sense and seize business opportunities and its innovation capabilities.

In order to test the second hypothesis, a correlation test was performed to examine whether there is a correlation between the company's dynamic capability to reconfigure and acquire resources with its possession of innovation capabilities. The results of the empirical study based on the correlation test show a high correlation between the company's dynamic capability for reconfiguration and acquisition of resources with its possession of innovation capabilities (Spearman coefficient 0.719, two-tailed significance 0.000). Following the theoretical assumption of a close relationship between company resources as the fundamental means for implementing innovation, and with that its innovation capabilities, the obtained results empirically confirm the theoretical conclusions. Following this analysis, hypothesis H2 is accepted and it is concluded that there is an association between the company's dynamic capability for reconfiguration and acquisition of resources and its innovation capabilities.

In order to test the third hypothesis, a correlation test was performed to examine whether there is an association between the company's dynamic capability for internal and external transformation with its possession of innovation capabilities. The results of the empirical study and the correlation test show a high level of correlation between possessing the dynamic capability for internal and external transformation and its innovation capability (Spearman coefficient 0.779, two-tailed significance 0.000). The earlier theoretical discussion of the close ties between organizational transformation, by enabling innovative dynamic processes within the company and the accompanying policies, and the entrepreneurial dynamically oriented operation on the one hand, with innovation capabilities on the other, suggested this association. The results of the empirical study confirm the theoretical conclusions. Following the conducted analysis, hypothesis H3 is accepted, and it is concluded that there is an association between a company's possession of the dynamic capability for internal and external transformation and its innovation capabilities.

To test the fourth set hypothesis, a correlation test was performed to examine whether there is a correlation between the company's dynamic capability for the integration of internal and external knowledge with its possession of innovation capabilities. The results of the correlation test conducted on companies in the sample showed the existence of a strong association between the company's possession of the dynamic capability for the integration of internal and external knowledge with the existence of its innovation capabilities (Spearman coefficient 0.790, two-tailed significance 0.000). Within the theoretical discussion of this association, the multidimensional influence of knowledge and innovation capabilities was observed. The dynamic character of this influence encompasses both implicit and explicit knowledge, and includes the creative element of the creation of knowledge that is associated with the innovation capabilities of the company. The conclusions derived from the theoretical consideration s were confirmed by the analysis, and hypothesis H4 is accepted. It is concluded that there is an association between the dynamic capabilities of a company for the integration of internal and external knowledge with its possession of innovation capabilities.

In order to test the fifth hypothesis, a correlation test was performed to examine whether there is an association between a company's dynamic capability for corporate coordination and activity with its possession of innovation capabilities. The correlation test within the empirical study showed that there was a strong correlation between the company's possession of the dynamic capability for corporate coordination and activity and its possession of innovation capabilities (Spearman coefficient 0.747, two-tailed significance 0.000). The theoretical associations discussed include coordinated drivers of innovation elements and its outputs following company dynamic activities, and which result in economic success. The theoretical association has been empirically supported, and following the statistical analysis, hypothesis H5 is accepted. Finally, it was concluded that there is an association between a company's dynamic capabilities for corporate coordination and activity with its possession of innovation capabilities.

VI. Conclusion

Due to the increasing frequency of change in business today, the capability for a company to execute dynamic actions and reactions has become an important strategic determinant for achieving successful business results. Considering that the ultimate goal of the application of these capabilities is to create a unique concept of company functioning that differentiates it from the competition, the dynamic and innovation capabilities of a company stand out as the concepts that can successfully realize this task, by creating a competitive advantage for those companies that employ them. This study confirmed the set model of dynamic and innovation capabilities, which can serve as a basis for new research on a different population. Furthermore, the influence of the company's dynamic capabilities on its innovation capabilities was examined, and the results indicated a very strong association between them, providing management with food for thought concerning the integration of these strategic concepts in their company operations.

References

[1] G. Hamel, *Leading the Revolution,* Boston: Harvard Business School Press, 2000.
[2] G. Hamel and P. Skarzynski, "Innovation: the new route to wealth", *Journal of Accountancy*, no. 192/5, pp. 65-69, 2001.
[3] A. Aleksic, "Role of organizational design in the development of a company's organizational capabilities", Doctoral Dissertation. Zagreb:Faculty of Economics & Business, (in Croatian), 2012.
[4] G. Byrne, D. Lubowe and A. Blitz, "Driving operational innovation using Lean Six Sigma", *IBM Institute for Business Value*, vol. 01-07, pp. 1-16, 2012.
[5] R. Benson-Armer,S. S. Otto and G. Webster, "Building capabilities for performance",*McKinsey & Company Insights*, Jan. 2014, pp. 1-12.
[6] Ernst & Young, "Innovating for growth",*EY Innovation*, no. 3, pp. 1-4, 2012.

[7] H. Mintzberg, B. Ahlstrand and J. Lampel, *Management? It's Not What You Think,* Harlow: Pearson Education Limited, 2010.
[8] R. Leoncini, S. Montresor and G. Vertova, *Dynamic Capabilities Between Firm Organization and Local Development,* Milano: CERIS/DSE-CNR, 2005.
[9] D. J. Teece, G. Pisano and A. Shuen,. "Dynamic capabilities and strategic management",*Strategic Management Journal,* no. 18/7, pp. 509-533, 1997.
[10] O. Jones, A. MacPherson and D. Jayawarna D, "Learning to grow: dynamic capabilities in new technology-based firms", *University of Liverpool Management School Publication,* no. 10, pp. 1-34, 2010.
[11] K. M. Eisenhardt and J. A. Martin, "Dynamic capabilities: what are they?",*Strategic Management Journal*, no. 21, pp. 1105–1112, 2000.
[12] A. Chang, P. C. Tsai and Y. Y. Lee, "Dynamic capabilities and innovation performance of publishing firms in digital age",*National ChengchiUniversity Publication,* no. 12, pp. 1-18, 2012.
[13] K. Lin and K. Huang, "Dynamic capability and its effects on firm performance",*American Journal of Applied Sciences,* no. 9/1, pp. 107-110, 2012.
[14] R. Pustkowski, J. Scott and J. Tesvic, "Why implementation matters", *McKinsey & Company Insights,* Aug. 2014, pp. 1-3.
[15] D. J. Teece, *Dynamic Capabilities& Strategic Management – Organizing for Innovation and Growth,* Oxford: Oxford University Press, 2009.
[16] D. J. Teece, "Capturing value from knowledge assets",*California Management Review,* no. 40/3, pp. 55-79, 1998.
[17] H. Itami and T. W. Roehl, *Mobilizing Invisible Assets*, Massachusetts: Harvard University Press, 1987.
[18] K. M. Wiig, "The intelligent enterprise and knowledge management",*Knowledge Research Institute articles*, http://www.krii.com/, 2000.
[19] C. Zott, "Dynamic capabilities and the emergence of intra-industry differential firm performance: insights from a simulation study", *Working paper*, Fontainebleau, France: INSEAD Department of Entrepreneurship, 2000.
[20] G. Hamel and C. K. Prahalad, *Competing for the Future*, Boston:Harvard Business School Press, 1994.
[21] H. Mintzberg, B. Ahlstrand and J. Lampel, *Strategy Safari – The Complete Guide Through the Wilds of Strategic Management,* Harlow: Prentice Hall, 1998.
[22] N. Bontis and C. W. Choo,*The Strategic Management of Intellectual Capital and Organizational Knowledge: A Collection of Readings,* Oxford: Oxford University Press, 2012.
[23] P. A. Pavlou and O. A. El Sawy,"Understanding the elusive black box of dynamic capabilities",*Decision Sciences, no.* 42/1, pp. 239-273, 2011.
[24] R. M. Grant, "Toward a knowledge-based theory of the firm",*Strategic Management Journal*, no. 17, pp. 109-122, 1996.
[25] M. H. Zack, "Developing a knowledge strategy",*California Management Review*, no. 41/3, pp. 125-145, 1999.
[26] R. M. Grant,"The resource-based theory of competitive advantage: implications for strategy formulation",*California Management Review*, Spring edition, no. 91, pp. 114-135, 1991.
[27] M. J. Hooper, D. Steeple and C. N. Winters, "Costing customer value: an approach for the agile enterprise", *International Journal of Operations & Production Management, no.* 21-5/6, pp. 630-644, 2001.
[28] G. Westerman, P. Weill and M. McDonald, "Business agility and IT capabilities",*MIT Sloan Management Research Briefings,* no. 6/1, pp. 1-4, 2006.
[29] Y. Y. Yusuf, M. Sarhadi and A. Gunasekaran, "Agile manufacturing: the drivers, concepts and attributes", *Int. Journal of Production Economics,* no. 62, pp. 33-43, 1999.
[30] UK Department for Business, Innovation and Skills, *Innovation Nation,* London: BIS, 2008.
[31] J. Fagerberg, D. C. Mowery and R. R. Nelson, *The Oxford Handbook of Innovation,* Oxford: Oxford University Press, 2005.
[32] Commission Of The European Communities, *Innovation Policy: Updating the Union's Approach in the Context of the Lisbon Strategy*, Brussels : Commission of the European Communities, 2003.
[33] P. F. Drucker, "The discipline of innovation",*Harvard Business Review, no.* 8, pp. 5-11, 2002.
[34] C. Schramm, *Innovation Measurement – Tracking the State of Innovation in the American Economy*, Washington: USA Department of Commerce, The Advisory Committee on Measuring Innovation in the 21st Century Economy, 2008.
[35] M. Rogers, "The definition and measurement of innovation", *Working Paper, n*o. 10/98, Melbourne Institute of Applied Economic and Social Research, University of Melbourne, 1998.
[36] P. F. Drucker, *Managing in Turbulent Times,* New York: Harper & Row Publishers, 1980.
[37] P. F. Drucker, *Managing for the Future – The 1990s and Beyond,* New York: Truman Talley Books, 1992.
[38] P. F. Drucker, *Innovation and Entrepreneurship: Practice and Principles,* New York: Harper & Row Publishers, 1985
[39] B. Lawson and D. Samson, "Developing innovation capability in organisations: a dynamic capabilities approach", *International Journal of Innovation Management*, no 5/3, pp. 377-400, 2001.
[40] D. Samson, *Innovation for Business Success - Achieving a Systematic Innovation Capability*, Melbourne: University of Melbourne, Department of Innovation, Industry, Science and Research, 2010.
[41] P. Gupta, *Firm Specific Measures of Innovation,*Chicago:Illinois Institute of Technology, 2007.
[42] OECD Organisation for Economic Co-Operation And Development, *Oslo Manual - Guidelines for Collecting and Interpreting Innovation Data,* Paris: OECD Publications, 2005.
[43] OECD Organisation for Economic Co-Operation And Development, *Canberra Manual – Measurement of Human Resources Devoted to S&T*, Paris: OECD Publications, 1995.
[44] OECD Organisation for Economic Co-Operation And Development, *Frascati Manual - Proposed Standard Practice for Surveys on Research and Experimental Development,* Paris: OECD Publications, 2002.
[45] M. Saunila and J. Ukko, "A conceptual framework for the measurement of innovation capability and its effects",*Measurement of innovation capability,* no. 7/41, pp. 355-375, 2012.
[46] I. Nonaka, "The knowledge-creating theory revisited: knowledge creation as a synthesizing process", *Knowledge Management Research & Practice*, no. 1, pp. 2-10, 2003.
[47] H. Hollanders, "Measuring innovation - the European Innovation Scoreboard",*UNU-MERIT Review*, no. 10, pp. 27-40, 2010.
[48] R. S. Jonash and T. Sommerlate, "The innovation premium - capturing the value of creativity",*Prism*, no. 3, pp. 5-25, 1999.
[49] C. L. Wang and P. K. Ahmed, "Dynamic capabilities: a review and research agenda", *The International Journal of Management Reviews,*no. 9/1, pp. 31-51, 2007.
[50] A. Protogerou, Y. Caloghirou and S. Lioukas, "Dynamic capabilities and their indirect impact on firm performance", *DRUID Working Paper*, no. 08-11, Danish Research Unit for Industrial Dynamics, 2008.
[51] J. P. Andrew, J. Manget, D. C. Michael, A. Taylor and H.Zablit,*Innovation 2010 – a return to prominence and the emergence of a new world order*, Boston: Boston Consulting Group, 2010.
[52] J. P. Andrew, K. Haanaes, D. C. Michael, H. L. Sirkin and A. Taylor, *Measuring innovation 2009 – the need for action*, Boston: Boston Consulting Group, 2009.
[53] M. Albaladejo and H. Romijn, "Determinants of innovation capability in small UK firms: an empirical analysis", Working Paper QEHWPS40, Eindhoven University of Technology, 2000.
[54] Croatian Bureau of Statistics, "Persons in paid employment, by activities, October 2014", Croatian Bureau of Statistics release, No. 9.2.1/10., 2014.